

Innershield® NR-233

Self-Shielded Flux-Cored Wire

(AWS A5.20-95: E71T-8)

NR-233 is an advanced technology, self-shielded flux-cored electrode designed for high deposition rate welding - even when welding out-of-position in seismic and non-seismic structural steel applications. It is also great for fillet welding for ship and barge fabrication. The electrode is welder-friendly, making it easier to pass tough qualification tests and deposit great looking beads. It does all this while delivering Charpy V-Notch properties that meet many of the more stringent codes and specifications for seismic applications.



Advantage Lincoln

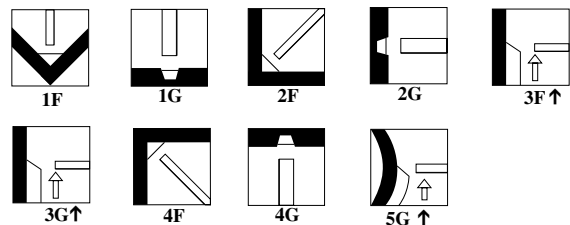
User Friendly

- For the engineer: meets the stringent codes and standards for Charpy V-Notch properties, such as those listed in FEMA 353.
- For the plant superintendent: higher deposition rates mean faster building erection, quicker launch of the barge, or more throughput in fabrication. In short: less cost and more profit.
- For the welder: a more forgiving arc with greater penetration makes it easier to pass qualification tests, and makes for better quality welds in production — and the welds look great.
- NR-233 has been formulated to minimize gas marking, even after the electrode has been exposed to the atmosphere.

Typical Applications

- Vertical up fillet and groove welds
- Overhead fillet and groove welds
- Seismic structural steel erection
- General structural steel erection
- Barge fabrication

Welding Positions



Conformance

AWS A5.20-95: E71T-8
ASME SFA-5.20; E71T-8

Allowable exposure per Appendix D of FEMA 353

1/16"

4 Weeks

.072"

4 Weeks

Note: Appendix D of FEMA 353 allows additional exposure beyond the 24 hour limit.

DIAMETERS/PACKAGING

Diameter in. (mm)	12.5 Lb. (5.7kg) Plastic Spool	25 Lb. (11.3kg) Plastic Spool	25 Lb. (11.3kg) Plastic Spool in Vacuum Sealed Bag
1/16 (1.6) .072 (1.8)	ED030933	ED030934 ED031030	ED031576 ED031577



MECHANICAL PROPERTIES – As required per AWS A5.20-95

	Yield Strength psi (MPa)	Tensile Strength psi (MPa)	Elongation (%)	Charpy V-Notch ft•lbf (Joules) @ -20°F (-29°C)
Requirements AWS E71T- 8	58,000 (400) min.	70,000 (480) min.	22 min.	20 (27) min.
Typical Test Results	62,000- 71,000 (430 - 490)	73,000 - 92,000 (505 - 635)	22 - 32	23 - 48 (31 - 65)

Note: The strength and elongation properties reported were obtained from a .505" tensile specimen artificially aged at 220° F (104° C) for 48 hours, as permitted by AWS A5.20-95. A naturally aged tensile specimen may take months to achieve the specified properties. See AWS A5.20-95, paragraph A8.3. The time required for the natural aging of weld deposits is dependent upon ambient conditions, weldment geometry, the metallurgical structure of the weld deposit and other factors.

TYPICAL OPERATING PROCEDURES

Diameter Polarity CTWD ⁽¹⁾ Wire Weight	Wire Feed Speed in./min (m/min)	Voltage (volts)	Approx. Current (amps)	Melt-Off Rate lbs/hr (kg/hr)	Deposition Rate lbs/hr (kg/hr)	Efficiency (%)
1/16" DC- 1/2-1-1/4"(13-32mm) 0.582 lbs./1000"	150 (3.8)	17-19	220	5.3 (2.4)	4.2 (1.9)	80
	200 (5.1)	19-21	245	7.1 (3.2)	5.4 (2.5)	76
	250 (6.4)	21-23	270	8.9 (4.0)	6.6 (3.0)	74
	300 (7.6)	23-25	295	10.4 (4.7)	7.7 (3.5)	75
	350 (8.9)	25-27	315	12.3 (5.6)	9.4 (4.3)	77
.072 DC- 3/4-1"(19-25mm) 0.746 lbs./1000"	100 (2.5)	17-18	185	4.5 (2.0)	3.6 (1.6)	80
	150 (3.8)	18-19	250	6.7(3.1)	5.4 (2.5)	80
	200 (5.1)	20-21	295	8.9 (4.0)	7.1 (3.2)	81
	250 (6.4)	22-23	330	11.2 (5.1)	8.9 (4.0)	79
	300 (7.6)	23-24	355	13.4 (6.1)	10.6 (4.8)	79

(1) To estimate ESO, subtract 1/4" (6.4mm) from CTWD.

Note: For horizontal welding, subtract 1 volt.

DEPOSIT COMPOSITION - As required per AWS A5.20-95

	%C	%Mn	%P	%S	%Si	%Al
Requirements AWS E71T-8	Report Only	1.75 max.	0.03 max.	0.03 max.	0.60 max.	1.8 max.
Typical Test Results	0.17-0.23	0.45-0.66	0.006-0.009	0.003	0.14-0.25	0.47-0.71

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This electrode has been tested in accordance with FEMA 353 - *Recommended Specifications and Quality Assurance Guidelines for Steel Moment-Frame Construction for Seismic Applications* and is capable of depositing weld metal that delivers minimum CVN properties of 40 ft.lbf at 70° F (54 Joules at 21° C) at low and high heat input levels. As required by the AWS classification, it meets a minimum CVN of 20 ft.lbf at -20° F (27 Joules at -29° C), when tested in accordance with AWS A5.20. This electrode will also deposit metal that will meet the requirements for H16 as tested according to AWS A4.3. FEMA certificates are available upon request.

TEST RESULTS

Test results for mechanical properties, deposit or electrode composition and diffusible hydrogen levels were obtained from a weld produced and tested according to prescribed standards, and should not be assumed to be the expected results in a particular application or weldment. Actual results will vary depending on many factors, including, but not limited to, weld procedure, plate chemistry and temperature, weldment design and fabrication methods. Users are cautioned to confirm by qualification testing, or other appropriate means, the suitability of any welding consumable and procedure before use in the intended application.

CUSTOMER ASSISTANCE POLICY

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